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COLONY COLLAPSE DISORDER IN HONEYBEES

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Colony collapse disorder is also known as Spring Dwindle, May disease, autumn collapse, etc is the phenomenon/situation where the majority of adult worker bees are lost from the colony leaving behind the queen bee, a few other bees, along with plenty of food. Such colonies are commonly referred to as dead colonies. This was predominantly observed in European bees. Farmers in the USA have seen a downfall of 30% - 90% of bees since 2006. The recent decline in the population of bees raises concerns in the agriculture fields as the number of insect-pollinated crops is increasing with a decrease of pollinators. Recent studies suggest multiple potential causes for this CCD viz. multiple sources of radiation, diseases, pesticide uses, predators, viruses, etc or there are possibilities that the combination of two or more causal factors simultaneously has a synergetic effect on the honeybees. Globally they help to generate a revenue of 57 billion Euros. Albert Einstein once predicted that if the bees vanished from our planet, mankind would soon extinct.

Varroa mites remain the world's most destructive honey bee killer. The mites, the viruses they transmit, and the chemical treatment they require are considered possible causes of CCD

Multiple theories have been put forward about the CCD cases like invasion of varroa mite and gut parasite(Nosema) in colonies causing loss of bees, Pesticides poisoning specially Neonicotinoids, Stress caused due to multiple biotic and abiotic factors, Inadequate food sources or poor quality of food, etc. but its always not necessary that sudden death of colony is CCD.

Since bees are declining at rapid rates multiple types of research have been conducted considering multiple causal factors and according to the findings cell phone are suspected of causing a rapid decrease in the bee population, EMRs(Electro Magnetic Radiations) are causing long-term negative impacts on the bees. This effect was first published in a peer review study in 1981, to find out its effect through powerful sources of radiation like microwave radiation. However, no significant effect was observed and any concrete evidence was put forward, that can state radiation or any other aforesaid mentioned factors for direct impact on honeybees causing CCDs. Another scientific study consisting of 7 studies on honeybees was carried out, 6 of them forecasted negative effects but none demonstrated specific links. An explanatory study in 2004 was conducted to study the non-thermal effects of electromagnetic exposures at 1880-1900MHZ but the outcome/analysis didn't forecast any negative effects on the honeybee's behavioural change, however, it established that close-range EMF may affect the flight and returning back ability of the bees to their hives which could potentially lead to colony collapse disorder in bees.

Loss of natural habitat which can result in poor nutrition and increased reliance on supple-mental diets are considered possible causes of CCD

In 2007, USDA established a CCD steering committee, which came up with an action plan consisting of a survey and collection of data, analysis of samples, driving hypothesis and possible preventive measures based on the results and data received globally a conference was held in 2013 which came up with the revised drafting Action plans to tackle CCD in honeybees. Multiple countries have passed laws to control the no. of towers. For reasons yet to be discovered, the cases of CCD have been substantially decreasing since 2016. It can be prevented if trees are provided at regular intervals. In public areas such as parks, urban areas can be gardened, use of radiation shield bee boxes, use of safer non-systemic pesticides, Implementation of Integrated insect-pest management, providing suitable nesting locations, etc.

The conclusion drawn from this article is preventive methods are in use and more are considered for on-field deployment to control the effects of radiation, studies need to be conducted with more sophisticated algorithms and technologies to find out the exact reason, frequencies, and factors that are responsible for CCD. The removal of towers or the radiation sources is not a straightforward solution to control the CCD of honeybees but certain guidelines need to be met in order to control the uncontrollable increasing number of towers in the nation. All these must be taken care of as only honeybees generate roughly around 200 million USD through their pollination services only.